

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ \_\_\_\_\_

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty.

For International Preliminary Examining Authority use only		
Identification of IPEA		Date of receipt of DEMAND
<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>		Applicant's or agent's file reference AA 1140
International application No. PCT/FI2004/000496	International filing date (day/month/year) 25.8.2004	(Earliest) Priority date (day/month/year) 25.9.2003
Title of invention Method and apparatus for fiberizing particularly paper and/or paperboard based material		
<b>Box No. II APPLICANT(S)</b>		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  KIVIAHO, Jouko Myllytörmäntie 20 FI-39610 Kovelähti Finland		Telephone No.  Facsimile No.  Teleprinter No.  Applicant's registration No. with the Office
State (that is, country) of nationality: Finland		State (that is, country) of residence: Finland
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)		
State (that is, country) of nationality:		State (that is, country) of residence:
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)		
State (that is, country) of nationality:		State (that is, country) of residence:
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.		

# PCT

## CHAPTER II

### FEE CALCULATION SHEET

#### Annex to the Demand

<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%; padding: 5px;">International application No. <b>PCT/FI2004/000496</b></td><td style="width: 50%; padding: 5px;">For International Preliminary Examining Authority use only</td></tr><tr><td style="padding: 5px;">Applicant's or agent's file reference <b>AA 1140</b></td><td style="padding: 5px;">Date stamp of the IPEA</td></tr></table>	International application No. <b>PCT/FI2004/000496</b>	For International Preliminary Examining Authority use only	Applicant's or agent's file reference <b>AA 1140</b>	Date stamp of the IPEA															
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Applicant <b>KIVIAHO, Jouko</b>																			
<b>CALCULATION OF PRESCRIBED FEES</b>  <table style="width: 100%;"><tr><td style="width: 60%;">1. Preliminary examination fee ..... <b>SEK</b> .....</td><td style="width: 20%; text-align: center; border: 1px solid black;"><b>5.000,-</b></td><td style="width: 20%; text-align: center; border: 1px solid black;"><b>P</b></td></tr><tr><td colspan="3"> </td></tr><tr><td>2. Handling fee (<i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i>) .....</td><td style="text-align: center; border: 1px solid black;"><b>1.160,-</b></td><td style="text-align: center; border: 1px solid black;"><b>H</b></td></tr><tr><td colspan="3"> </td></tr><tr><td>3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box .....</td><td style="text-align: center; border: 1px solid black;"><b>6.160,-</b></td><td></td></tr><tr><td></td><td style="text-align: center; border: 1px solid black;"><b>TOTAL</b></td><td></td></tr></table>		1. Preliminary examination fee ..... <b>SEK</b> .....	<b>5.000,-</b>	<b>P</b>				2. Handling fee ( <i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i> ) .....	<b>1.160,-</b>	<b>H</b>				3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box .....	<b>6.160,-</b>			<b>TOTAL</b>	
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<b>AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT</b> <i>(This mode of payment may not be available at all IPEAs)</i> <table style="width: 100%;"><tr><td style="width: 45%; vertical-align: top;"><input type="checkbox"/> Authorization to charge the total fees indicated above.  <input type="checkbox"/> <i>(This check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.</td><td style="width: 55%; vertical-align: top;">IPEA/ _____ Deposit Account No.: _____ Date: _____ Name: _____ Signature: _____</td></tr></table>		<input type="checkbox"/> Authorization to charge the total fees indicated above.  <input type="checkbox"/> <i>(This check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	IPEA/ _____ Deposit Account No.: _____ Date: _____ Name: _____ Signature: _____																
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24 MAR 2006

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Beneficiary	PATENT OCH REGISTRERINGSVERKET PRV BOX 5055 10242 STOCKHOLM
Beneficiary's account	5439-1001349
Beneficiary's bank	SKANDINAVISKA ENSKILDA BANKEN  2, SERGELS TORG STOCKHOLM
SWIFT code	ESSESESS
Clearing code	
Information to beneficiary	DEMAND/PCT/FI2004/000496, AA 1140, KIVIAHO, JOUKO
Amount and currency	6 160,00 SEK
Debit date	26.04.05
Ordering customer	Müll
Filing code	0504262584LV150358

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Claims

1. A method for fiberizing particularly paper  
5 and/or paperboard based material, for feeding  
fiberized material, such as pulp wool, wood fiber or  
the like, subsequently to a further process, such as  
its application site, intermediate storage, shipping  
10 and/or the like, the fiberization being performed by  
means of a pulper (1), which is provided with a  
primary space (A) for processing the material to be  
fiberized with a knife assembly (1a) included therein  
and rotating around a rotation axis (s), wherein by  
15 the action of its rotation (w) the material to be  
processed is preprocessed for fiberization by means of  
a primary knife unit, belonging to the knife assembly,  
whereafter it is being fiberized by means of a  
secondary knife unit, belonging to the knife assembly,  
20 and by leading it subsequently through a screen  
assembly (1b) associated with, such as surrounding the  
knife assembly, into a secondary space (B) present in  
the pulper (1), for supplying the fiberized material  
further through an expulsion opening (UA) of the  
25 pulper (1) to further processing, **characterized in  
that** the material to be fiberized is preprocessed by  
means of a primary knife unit (1a'), which has at  
least two members and/or is placed in a supply opening  
(x12) in a way that it is able to preprocess  
30 essentially all of the material to be fed into the  
pulper (1), whereafter the material is being finally  
fiberized by forcing it to pass between vanes (1a''),  
included in the secondary knife unit (1a'') and  
disposed in overlying positions divergent relative to  
35 each other, the thickness of the vanes being between  
5 - 20 mm.

2. A method as set forth in claim 1,  
**characterized in that** the material to be fiberized is

preprocessed by a primary knife unit (1a') which has at least two members, whereby first knife members (1a'1) included in the primary knife unit (1a') are disposed in a plane substantially coincident with the vanes (1a"1) of the secondary knife unit (1a") for rotation together therewith, and second knife members (1a'2) are adapted to be integral with the first knife members (1a'1) and to protrude therefrom in a direction essentially away from the knife assembly (1a).

3. A method as set forth in claim 1 or 2, wherein the fiberization is performed essentially as a dry process, **characterized in that** the material to be fed into the pulper (1) and/or to be fiberized therein is supplied with one or several additives (XY), such as boric acid, borax and/or the like, particularly for enhancing the thermal/fire resistance properties, decay resistance properties and/or the like of a resulting product, such as pulp wool, wood fiber or the like to be used as thermal insulation.

4. A method as set forth in any of the preceding claims 1-3, **characterized in that** the material to be fiberized and/or the additive (XY) is fed to the fiberization process from a supply assembly (x1) in connection with the pulper (1), such as from one or several supply pockets (x11), supply openings (x12) and/or the like, in response to an underpressure provided essentially by the rotary motion (w) of the knife assembly (1a).

5. An apparatus for fiberizing particularly paper and/or paperboard based material, for feeding fiberized material, such as pulp wool, wood fiber or the like, subsequently to a further process, such as its application site, intermediate storage, shipping and/or the like, said apparatus comprising a pulper

(1), which is provided with a primary space (A) and a knife assembly (1a) included therein and rotating around a rotation axis (s), which comprises a primary knife unit for preprocessing of the material to be fed into the pulper (1) for fiberization and a secondary knife unit, by which the material to be processed is fiberized by forcing it by the action of the knife assembly's (1a) rotation (w) through a screen assembly (1b) associated with, such as surrounding the knife assembly, into a secondary space (B) present in the pulper (1), for supplying the fiberized material further through an expulsion opening (UA) of the pulper (1) to further processing, **characterized in that** a primary knife unit (1a') included in the knife assembly (1a) is adapted to consist of at least two members and/or to be placed in a supply opening (x12) in a way that it is able to preprocess essentially all of the material to be fed into the pulper (1), and that a secondary knife unit (1a") consists of vanes (1a"1), disposed in overlying positions divergent relative to each other and the thickness of which being between 5 - 20 mm.

6. An apparatus as set forth in claim 5, **characterized in that** first knife members (1a'1) of the primary knife unit (1a'), consisting of at least two members, are disposed in a plane substantially coincident with the vanes (1a"1) of the secondary knife unit for rotation together therewith, and second knife members (1a'2) are adapted to be integral with the first knife members (1a'1) and to protrude therefrom in a direction essentially away from the knife assembly (1a).

7. An apparatus as set forth in claim 5 or 6, **characterized in that** the second knife members (1a'2) of the primary knife unit (1a') are adapted to be perpendicular to the first knife members (1a'1).

8. An apparatus as set forth in any of the preceding claims 5-7, **characterized in that** the pulper (1) has in connection therewith a supply assembly (X1) for supplying the pulper (1) with a material to be fiberized and/or with one or several additives (XY), such as boric acid, borax and/or the like, particularly for enhancing the thermal/fire resistance properties, decay resistance properties and/or the like of a resulting product, such as pulp wool, wood fiber or the like to be used as thermal insulation, from one or several supply pockets (x11), supply openings (x12) and/or the like, in response to an underpressure provided essentially by the rotary motion (w) of the knife assembly (1a).

9. An apparatus as set forth in any of the preceding claims 5-8, **characterized in that** at least the primary knife unit's (1a') first knife members and/or second knife members are designed in the form of elongated and radially disposed vanes (1a'1/ 1a'2), having a thickness of 5-20 mm, most preferably 10 mm.

10. An apparatus as set forth in any of the preceding claims 5-9, **characterized in that** the clearance (v) between the secondary knife unit (1a'') and the screen assembly (1b) is within the range of 10-50 mm, most preferably 20 mm, and/or that the screen assembly (1b) has a screen capacity within the range of 30-50%, most preferably 40%.

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1AP20 Rec'd PCT/PTO 24 MAR 2006

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Re: International Patent Application No. PCT/FI2004/000496  
Applicant: Kiviaho, Jouko  
Agent's file reference: AA 1140

#### WRITTEN REPLY REGARDING WRITTEN OPINION

The applicant has studied the present Written Opinion and particularly the most relevant document (US 2,448,839) cited therein.

From the point of view of a man skilled in the art it should be noted first of all that the solution according to US 2,448,849 may be applicable for certain purposes, such as for comminuting and mixing of different kinds of materials, but, however, not for the main purpose of the present invention that is for actual fiberization.

The solution according to patent US 2,448,849 is based on a rotor construction, which may be interpreted to comprise a primary knife unit for preprocessing a part of the material to be processed and a rotor assembly for actual comminuting and mixing of the material to be processed. The rotor assembly belonging to this construction consists of radially directed wires or thin metal strips, being placed on layers placed on top of the other, which is why this construction as such is not applicable particularly for fiberization of paper and/or paper board based material. This is due to the fact that the rotor assembly, being put together from flexible wires or the like, is not in practice able to force this kind of material through a screen assembly, because the wires or the like forming the rotor assembly will bend in a curve. The primary knife unit, being exploited in the solution in question, for its part may process only a small part of the material that gets drifted inside the internal space or the device provided with the rotor assembly, while



most part of the material may pass by the same totally. This is why, the primary knife unit carried out in this way may not support fiberization adequately, which is why it is even more impossible to fiberize particularly paper and/or paper board based material with this kind of construction.

In this connection, the applicant thus points out the main differences of the method and apparatus according to the present invention particularly with respect to the above solution, which are based first of all on the fact that the material to be fiberized is being preprocessed by means of a primary knife unit, which has at least two members and/or that is placed in a supply opening in a way that it is able to preprocess essentially all of the material to be fed into the pulper. Both of the above features may be clearly seen for example, when comparing figure 2 of the present application e.g. to figure 2 of the above US patent 2,2448,849.

Furthermore one essential difference of the present invention with respect to the solution according to the above US patent is the fact that the material to be fiberized is being forced to pass between vanes included in the secondary knife unit, being disposed in overlaying positions divergent relative to each other and the thickness of which being in the range of 5 - 20 mm. So, in this connection, the secondary knife unit is not based on flexible structures, but instead on really stiff and straight vanes, which enable carrying out fiberization in a way, that the material gets fiberized partly already, when it gets drifted between the vanes. By means of this kind of stiff-structured vanes, it is possible to make sure also that the material to be fiberized will get forced through the screen unit surrounding the secondary knife unit. This kind of fiberization is not in any way possible, when exploiting a solution according to US 2,448,849, at least when the intention is to fiberize paper and/or paper board based material. On the other hand, the solution according to the US patent in question is not even meant for this kind of a purpose, because it has been stated in the very beginning of this document that the construction in question relates to rotor constructions for a wide variety of comminuting and mixing operations.

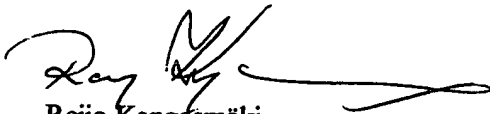
So, the applicant forwards thus an amended set of claims, in which the characterizing parts of the independent claims have been specified particularly to those features described above. In this connection, however, the original dependent claims 3 and 8 have been removed and the rest of the original dependent claims have been reorganized as new claims 2-4 and 6-10 respectively.

On grounds of the above, the applicant has thus every reason to look forward to receiving a positive report regarding patentability.

Tampere, on the 27th of April, 2005

Applicant: Kiviaho, Jouko

Agent



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Encls. Amended set of claims

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